Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A method for dynamically segmenting a digital data file resident within at least one digital data storage device of multiple digital data storage devices associated with a first computing system to facilitate transfer of the segmented digital data file from said first computing system to at least one of a plurality of second computing systems, whereby said method comprises the steps of

a) requesting an identifier for said digital data file;

b) requesting a range of locations within the multiple data storage devices where said digital data file is resident;

c) calculating a new segment size list for said digital data file describing a fragmentation of said digital data file as a function of demand for all digital data files resident on said digital data storage devices, size of each digital data file of all digital data files, amount of retention space available on each of the plurality of digital data storage devices, and available bandwidth for communication with the plurality of second computing systems;

d) if said digital data file has been previously segmented, comparing the new segment size list to an existing segment size list;

e) if the existing segment size list provides a more facilitated transfer of said digital data file, transferring said digital data file to the second computing system according to said existing segment size list;

f) if the new segment size list provides a more facilitated transfer of said digital file,

creating a new file identifier for each new segment ascertained by the creating of the new segment size list,

creating a new range of locations for each new segment of the digital data file to identify the location for each new segment, and

storing the digital data file at said locations for each new segment;

g) transferring each new segment of said digital data file to at least one of the second computing systems; and

repeating steps a) through g) at each request for each digital data file.

2. (Original) The method of claim 1 wherein calculating the new segment size list comprises the steps of:

determining a number of storage devices attached to said first computing system available to retain a plurality of segments of said digital data file;

determining a maximum digital data transfer load for the storage devices attached to said first computing system;

assigning a minimum segment size which is the smallest amount of digital data to be contained within one segment of the digital data file;

calculating a first segment size as a first function of a number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size;

assigning a last segment size as the minimum segment size;

calculating all remaining segment sizes as a second function of the number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size; and

partitioning said digital data file into segments whereby the first segment of the digital data file is of the first segment size, the last segment of the digital data file is of the last segment size, and all the remaining segments of the digital data file is of the remaining segment sized.

3. (Original) The method of claim 2 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

4. (Original) The method of claim 2 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \Big/ \mathbf{M_l} - \mathbf{C_l} \right)$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load, and

$\mathbf{C_l}$ is the current digital data transfer load.

5. (Original) The method of claim 2 further comprising the step of:

determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

6. (Original) The method of claim 5 wherein the first function is further dependent upon the file interactivity factor.

7. (Original) The method of claim 6 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{l}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

C_l is the current digital data transfer load,

and

I is the file interactivity factor.

8. (Original) The method of claim 5 wherein the second function is further dependent upon the file interactivity factor.

9. (Original) The method of claim 8 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, V/f)$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

I is the file Inter activity factor.

10. (Original) The method of claim 2 further comprising the step of:

determining a file usage factor describing a number of requests for said digital data file for a period of time.

11. (Original) The method of claim 10 wherein the first function is further dependent upon the file usage factor.

12. (Original) The method of claim 11 wherein the first function to determine the first segment size is:

$$Seg1 = \min(SegSize_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

13. (Original) The method of claim 9 wherein the second function is further dependent upon the file usage factor.

14. (Original) The method of claim 13 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments;

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

$\mathbf{C_l}$ is the current digital data transfer load, and

H is the file usage factor.

15. (Original) The method of claim 2 further comprising the steps of:

determining a file usage factor describing a number of requests for said digital data file for a period of time; and

determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

16. (Original) The method of claim 15 wherein the first function is further dependent upon the file usage factor and the file interactivity factor.

17. (Original) The method of claim 16 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l}/\mathbf{M_l} - \mathbf{C_l}\right) + \mathbf{H} + \mathbf{I}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

18. (Original) The method of claim 15 wherein the second function is further dependent upon the file usage factor and the file interactivity factor.

19. (Original) The method of claim 18 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

20. (Original) The method of claim 1 wherein the locations at which the segments of said data file are located are within the multiple storage devices of the first computing system.

21. (Original) The method of claim 1 wherein the locations at which the segments of said data file are located are within multiple storage devices of the plurality of the second computing systems.

22. (Original) The method of claim 1 wherein the digital data file is a video file to be transferred isochronously to at least one of the second computing systems.

23. (Amended) A digital data service system in communication with a plurality of computing systems to provide at least one digital data file of a plurality of digital data files to at least one of the plurality of computing systems, comprising:

a plurality of digital data file storage devices in communication with each other and with any of the plurality of computing systems for storing a plurality of dynamically generated segments of said provided data file, said segments stored within said plurality of digital data file storage devices to facilitate transfer of said provided data file to at least one of the plurality of computing systems; and

a segmentation apparatus in communication with the plurality of digital data file storage devices, which, at a request of any of the digital data files, dynamically fragments any requested digital data file into a plurality of segments to facilitate transfer to and processing by at least one of the computing systems of said segments.

24. (Previously Presented) The system of claim 23 wherein the segmentation apparatus performs the steps of:

a) requesting an identifier for said digital data file;

b) requesting a range of locations within the multiple data storage devices where said digital data file is resident;

c) calculating a new segment size list for said digital data file describing a fragmentation of said digital data file as a function of demand for all digital data files resident on said digital data storage devices, size of each digital data file of all digital data files, amount of retention space available on each of the plurality of digital data storage devices, and available bandwidth for communication with the plurality of computing systems;

d) if said digital data file has been previously segmented, comparing the new segment size list to an existing segment size list;

e) if the existing segment size list provides a more facilitated transfer of said digital data file, transferring said digital data file to the computing system according to said existing segment size list;

f) if the new segment size list provides a more facilitated transfer of said digital file,

creating a new file identifier for each new segment ascertained by the creating of the new segment size list,

creating a new range of locations for each new segment of the digital data file to identify the location for each new segment, and

storing the digital data file at said locations for each new segment;

g) transferring each new segment of said digital data file to at least one of the computing systems; and

repeating steps a) through g) at each request for each digital data file.

25. (Original) The system of claim 24 wherein calculating the new segment size list comprises the steps of:

determining a number of storage devices attached to said first computing system available to retain a plurality of segments of said digital data file;

determining a maximum digital data transfer load for the storage devices attached to said first computing system;

assigning a minimum segment size which is the smallest amount of digital data to be contained within one segment of the digital data file;

calculating a first segment size as a first function of a number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size;

assigning a last segment size as the minimum segment size;

calculating all remaining segment sizes as a second function of the number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size; and

partitioning said digital data file into segments whereby the first segment of the digital data file is of the first segment size, the last segment of the digital data file is of the last segment size, and all the remaining segments of the digital data file is of the remaining segment sized.

26. (Original) The system of claim 25 wherein the segmentation apparatus the further performs the steps of:

assigning one of the number of storage devices to retain each segment of the digital data file; and

assigning an address within the storage devices to identify the location of an assigned segment.

27. (Original) The system of claim 25 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

28. (Original) The system of claim 25 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, V/f)$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

29. (Original) The system of claim 25 further comprising the step of:

determining a file interactivity factor describing a number of jumps by the computing system within the digital data file.

30. (Original) The system of claim 29 wherein the first function is further dependent upon the file interactivity factor.

31. (Original) The system of claim 30 wherein the first function to determine the first segment size is:

$$Seg1 = \min(SegSize_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

I is the file interactivity factor.

32. (Original) The system of claim 29 wherein the second function is further dependent upon the file interactivity factor.

33. (Original) The system of claim 32 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

C_l is the current digital data transfer load,

and

I is the file Inter activity factor.

34. (Original) The system of claim 25 further comprising the step of:

determining a file usage factor describing a number of requests for said digital data file for a period of time.

35. (Original) The system of claim 34 wherein the first function is further dependent upon the file usage factor.

36. (Original) The system of claim 35 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

37. (Original) The system of claim 34 wherein the second function is further dependent upon the file usage factor.

38. (Original) The system of claim 37 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

39. (Original) The system of claim 25 further comprising the steps of:

determining a file usage factor describing a number of requests for said digital data file for a period of time; and

determining a file interactivity factor describing a number of jumps by the computing system within the digital data file.

40. (Original) The system of claim 39 wherein the first function is further dependent upon the file usage factor and the file interactivity factor.

41. (Original) The system of claim 40 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H} + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

42. (Original) The system of claim 39 wherein the second function is further dependent upon the file usage factor and the file interactivity factor.

43. (Original) The system of claim 42 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \Big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H} + \mathbf{I}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

44. (Original) The system of claim 25 wherein the locations at which the segments of said data file are located are within the multiple storage devices of the first computing system.

45. (Original) The system of claim 25 wherein the locations at which the segments of said data file are located are within multiple storage devices of the plurality of the computing systems.

46. (Original) The system of claim 23 wherein the digital data file is a video file to be transferred isochronously to the computing system.

47. (Previously Presented) An apparatus for dynamically segmenting a digital data file resident within at least one digital data storage device of multiple digital data storage devices associated with a first computing system to facilitate transfer of the segmented digital data file from said first computing

system to at least one of a plurality of second computing systems, whereby said apparatus comprises the steps of

a) means for requesting an identifier for said digital data file;

b) means for requesting a range of locations within the multiple data storage devices where said digital data file is resident;

c) means for calculating a new segment size list for said digital data file describing a fragmentation of said digital data file as a function of demand for all digital data files resident on said digital data storage devices, size of each digital data file of all digital data files, amount of retention space available on each of the plurality of digital data storage devices, and available bandwidth for communication with the plurality of second computing systems;

e) means comparing the new segment size list to an existing segment size list, if said digital data file has been previously segmented;

f) means for transferring said digital data file to the second computing system according to said existing segment size list, if the existing segment size list provides a more facilitated transfer of said digital data file;

g) means for:

creating a new file identifier for each new segment ascertained by the creating of the new segment size list,

creating a new range of locations for each new segment of the digital data file to identify the location for each new segment, and

storing the digital data file at said locations for each new segment,

if the new segment size list provides a more facilitated transfer of said digital file;

h) means for transferring each new segment of said digital data file to at least one of the second computing systems; and

means for executing the means of steps of a) through h) at each request for each digital data file.

48. (Original) The apparatus of claim 47 wherein the means for calculating the new segment size list comprises:

means for determining a number of storage devices attached to said first computing system available to retain a plurality of segments of said digital data file;

means for determining a maximum digital data transfer load for the storage devices attached to said first computing system;

means for assigning a minimum segment size which is the smallest amount of digital data to be contained within one segment of the digital data file;

means for calculating a first segment size as a first function of a number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size;

means for assigning a last segment size as the minimum segment size;

means for calculating all remaining segment sizes as a second function of the number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size; and

means for partitioning said digital data file into segments whereby the first segment of the digital data file is of the first segment size, the last segment of the digital data file is of the last segment size, and all the remaining segments of the digital data file is of the remaining segment sized.

49. (Original) The apparatus of claim 48 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right)$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load, and

$\mathbf{C_l}$ is the current digital data transfer load.

50. (Original) The apparatus of claim 48 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize_{min}}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

51. (Original) The apparatus of claim 48 further comprising:

means for determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

52. (Original) The apparatus of claim 51 wherein the first function is further dependent upon the file interactivity factor.

53. (Original) The apparatus of claim 52 wherein the first function to determine the first segment size is:

$$Seg1 = \min(SegSize_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

I is the file interactivity factor.

54. (Original) The apparatus of claim 51 wherein the second function is further dependent upon the file interactivity factor.

55. (Original) The apparatus of claim 54 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{l}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

C_l is the current digital data transfer load,

and

I is the file Inter activity factor.

56. (Original) The apparatus of claim 48 further comprises:

means for determining a file usage factor describing a number of requests for said digital data file for a period of time.

57. (Original) The apparatus of claim 56 wherein the first function is further dependent upon the file usage factor.

58. (Original) The apparatus of claim 57 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \Big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

59. (Original) The apparatus of claim 56 wherein the second function is further dependent upon the file usage factor.

60. (Original) The apparatus of claim 59 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

61. (Original) The apparatus of claim 48 further comprises:

means for determining a file usage factor describing a number of requests for said digital data file for a period of time; and

means for determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

62. (Original) The apparatus of claim 61 wherein the first function is further dependent upon the file usage factor and the file interactivity factor.

63. (Original) The apparatus of claim 62 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H} + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

64. (Original) The apparatus of claim 61 wherein the second function is further dependent upon the file usage factor and the file interactivity factor.

65. (Original) The apparatus of claim 64 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H} + \mathbf{I}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

66. (Original) The apparatus of claim 47 wherein the locations at which the segments of said data file are located are within the multiple storage devices of the first computing system.

67. (Original) The apparatus of claim 47 wherein the locations at which the segments of said data file are located are within multiple storage devices of the plurality of the second computing systems.

68. (Original) The apparatus of claim 47 wherein the digital data file is a video file to be transferred isochronously to at least one of the second computing systems.

69. (Previously Presented) A medium for retaining a computer program to dynamically segment a digital data file resident within at least one digital data storage device of multiple digital data storage devices associated with a first

computing system to facilitate transfer of the segmented digital data file from said first computing system to at least one of a plurality of second computing systems, whereby said method comprises the steps of

a) requesting an identifier for said digital data file;

b) requesting a range of locations within the multiple data storage devices where said digital data file is resident;

c) calculating a new segment size list for said digital data file describing a fragmentation of said digital data file as a function of demand for all digital data files resident on said digital data storage devices, size of each digital data file of all digital data files, amount of retention space available on each of the plurality of digital data storage devices, and available bandwidth for communication with the plurality of second computing systems;

d) if said digital data file has been previously segmented, comparing the new segment size list to an existing segment size list;

e) if the existing segment size list provides a more facilitated transfer of said digital data file, transferring said digital data file to the second computing system according to said existing segment size list;

f) if the new segment size list provides a more facilitated transfer of said digital file,

creating a new file identifier for each new segment ascertained by the creating of the new segment size list,

creating a new range of locations for each new segment of the digital data file to identify the location for each new segment, and

storing the digital data file at said locations for each new segment;

g) transferring each new segment of said digital data file to at least one of the second computing systems; and

repeating steps a) through g)at each request for each digital data file.

70. (Original) The medium of claim 69 wherein calculating the new segment size list comprises the steps of:

determining a number of storage devices attached to said first computing system available to retain a plurality of segments of said digital data file;

determining a maximum digital data transfer load for the storage devices attached to said first computing system;

assigning a minimum segment size which is the smallest amount of digital data to be contained within one segment of the digital data file;

calculating a first segment size as a first function of a number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size;

assigning a last segment size as the minimum segment size;

calculating all remaining segment sizes as a second function of the number of the storage devices, the current digital data transfer load, the maximum digital data transfer load, and the minimum segment size; and

partitioning said digital data file into segments whereby the first segment of the digital data file is of the first segment size, the last segment of the digital data file is of the last segment size, and all the remaining segments of the digital data file is of the remaining segment sized.

71. (Original) The medium of claim 70 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

72. (Original) The medium of claim 70 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load, and

C_l is the current digital data transfer load.

73. (Original) The medium of claim 70 further comprising the step of:

determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

74. (Original) The medium of claim 73 wherein the first function is further dependent upon the file interactivity factor.

75. (Original) The medium of claim 74 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{\mathbf{min}}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

$\mathbf{M_l}$ is the maximum digital data transfer load,

$\mathbf{C_l}$ is the current digital data transfer load, and

I is the file interactivity factor.

76. (Original) The medium of claim 73 wherein the second function is further dependent upon the file interactivity factor.

77. (Original) The medium of claim 76 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize_{min}}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

I is the file Inter activity factor.

78. (Original) The medium of claim 70 further comprising the step of:

determining a file usage factor describing a number of requests for said digital data file for a period of time.

79. (Original) The medium of claim 78 wherein the first function is further dependent upon the file usage factor.

80. (Original) The medium of claim 79 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

81. (Original) The medium of claim 79 wherein the second function is further dependent upon the file usage factor.

82. (Original) The medium of claim 81 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load, and

H is the file usage factor.

83. (Original) The medium of claim 70 further comprising the steps of:

determining a file usage factor describing a number of requests for said digital data file for a period of time; and

determining a file interactivity factor describing a number of jumps by the second computing system within the digital data file.

84. (Original) The medium of claim 83 wherein the first function is further dependent upon the file usage factor and the file interactivity factor.

85. (Original) The medium of claim 84 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H + I$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

86. (Original) The medium of claim 83 wherein the second function is further dependent upon the file usage factor and the file interactivity factor.

87. (Original) The medium of claim 86 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} \big/ \mathbf{M_l} - \mathbf{C_l} \right) + \mathbf{H} + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

88. (Original) The medium of claim 69 wherein the locations at which the segments of said data file are located are within the multiple storage devices of the first computing system.

89. (Original) The medium of claim 69 wherein the locations at which the segments of said data file are located are within multiple storage devices of the plurality of the second computing systems.

90. (Original) The medium of claim 69 wherein the digital data file is a video file to be transferred isochronously to at least one of the second computing systems.

91. (Amended) A digital video data service system in communication with a plurality of computing systems to provide at least one digital video data file of a plurality of digital video data files to at least one of the plurality of computing systems, comprising:

a plurality of digital video data file storage devices in communication with each other and with any of the plurality of computing systems for storing a

plurality of dynamically generated segments of said provided digital video data file, said segments stored within said plurality of digital video data file storage devices to facilitate transfer of said provided digital video data file to at least one of the plurality of computing systems; and

a segmentation apparatus in communication with the plurality of digital video data file storage devices, which, at a request of any of the digital video data files, dynamically fragments any requested digital video data file into a plurality of segments to facilitate transfer to and processing by at least one of the second computing systems of said segments.

92. (Previously Presented) The system of claim 91 wherein the segmentation apparatus performs the steps of:

a) requesting an identifier for said digital video data file;

b) requesting a range of locations within the multiple data storage devices where said digital video data file is resident;

c) calculating a new segment size list for said digital video data file describing a fragmentation of said digital video data file as a function of demand for all digital video data files resident on said digital video data storage devices, size of each digital video data file of all digital video data files, amount of retention space available on each of the plurality of digital video data storage devices, and available bandwidth for communication with the plurality of computing systems;

d) if said digital video data file has been previously segmented, comparing the new segment size list to an existing segment size list;

e) if the existing segment size list provides a more facilitated transfer of said digital video data file, transferring said digital video data file to the computing system according to said existing segment size list;

f) if the new segment size list provides a more facilitated transfer of said digital file,

creating a new file identifier for each new segment ascertained by the creating of the new segment size list,

creating a new range of locations for each new segment of the digital video data file to identify the location for each new segment, and

storing the digital video data file at said locations for each new segment;

g) transferring each new segment of said digital video data file to at least one of the computing systems; and

repeating steps a) through g) at each request for each digital video data file.

93. (Original) The system of claim 92 wherein calculating the new segment size list comprises the steps of:

determining a number of storage devices attached to said first computing system available to retain a plurality of segments of said digital video data file;

determining a maximum digital video data transfer load for the storage devices attached to said first computing system;

assigning a minimum segment size which is the smallest amount of digital video data to be contained within one segment of the digital video data file;

calculating a first segment size as a first function of a number of the storage devices, the current digital video data transfer load, the maximum digital video data transfer load, and the minimum segment size;

assigning a last segment size as the minimum segment size;

calculating all remaining segment sizes as a second function of the number of the storage devices, the current digital video data transfer load, the maximum digital video data transfer load, and the minimum segment size; and

partitioning said digital video data file into segments whereby the first segment of the digital video data file is of the first segment size, the last segment of the digital video data file is of the last segment size, and all the remaining segments of the digital video data file is of the remaining segment sized.

94. (Original) The system of claim 93 wherein the segmentation apparatus the further performs the steps of:

assigning one of the number of storage devices to retain each segment of the digital video data file; and

assigning an address within the storage devices to identify the location of an assigned segment.

95. (Original) The system of claim 93 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_I} \Big/ \mathbf{M_I} - \mathbf{C_I} \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load, and

C_l is the current digital video data transfer load.

96. (Original) The system of claim 93 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_l} - \mathbf{C_l} \right)$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load, and

C_l is the current digital video data transfer load.

97. (Original) The system of claim 93 further comprising the step of:

determining a file interactivity factor describing a number of jumps by the computing system within the digital video data file.

98. (Original) The system of claim 97 wherein the first function is further dependent upon the file interactivity factor.

99. (Original) The system of claim 98 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + I$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load,

C_l is the current digital video data transfer load, and

I is the file interactivity factor.

100. (Original) The system of claim 97 wherein the second function is further dependent upon the file interactivity factor.

101. (Original) The system of claim 100 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_l} / \mathbf{M_i} - \mathbf{C_l} \right) + \mathbf{I}$$

where

$\mathbf{N_d}$ is the number of storage devices available to retain the segments of the digital video data file,

$\mathbf{M_l}$ is the maximum digital video data transfer load,

$\mathbf{C_l}$ is the current digital video data transfer load, and

I is the file Inter activity factor.

102. (Original) The system of claim 93 further comprising the step of:

determining a file usage factor describing a number of requests for said digital video data file for a period of time.

103. (Original) The system of claim 102 wherein the first function is further dependent upon the file usage factor.

104. (Original) The system of claim 103 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load,

C_l is the current digital video data transfer load, and

H is the file usage factor.

105. (Original) The system of claim 102 wherein the second function is further dependent upon the file usage factor.

106. (Previously Presented) The system of claim 105 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load,

C_l is the current digital video data transfer load, and

H is the file usage factor.

107. (Original) The system of claim 93 further comprising the steps of:

determining a file usage factor describing a number of requests for said digital video data file for a period of time; and

determining a file interactivity factor describing a number of jumps by the computing system within the digital video data file.

108. (Original) The system of claim 107 wherein the first function is further dependent upon the file usage factor and the file interactivity factor.

109. (Original) The system of claim 108 wherein the first function to determine the first segment size is:

$$\mathbf{Seg1} = \mathbf{min}(\mathbf{SegSize}_{min}, V/f)$$

where

Seg1 is the first segment size,

min is the minimum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$f = N_d + \left(M_l / M_l - C_l \right) + H + I$$

where

N_d is the number of storage devices available to retain the segments of the digital video data file,

M_l is the maximum digital video data transfer load,

C_l is the current digital video data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

110. (Original) The system of claim 107 wherein the second function is further dependent upon the file usage factor and the file interactivity factor.

111. (Original) The system of claim 110 wherein the second function to determine the remaining segment sizes is:

$$\mathbf{Segn} = \mathbf{max}(\mathbf{SegSize}_{min}, \mathbf{V/f})$$

where

Segn is the a segment size for one segment of the remaining segments,

max is the maximum function of two variables,

V is a total size of the digital video data file, and

f is determined by the formula:

$$\mathbf{f} = \mathbf{N_d} + \left(\mathbf{M_I} \big/ \mathbf{M_I} - \mathbf{C_I} \right) + \mathbf{H} + \mathbf{I}$$

where

N_d is the number of storage devices available to retain the segments of the digital data file,

M_l is the maximum digital data transfer load,

C_l is the current digital data transfer load,

H is the file usage factor, and

I is the file Inter activity factor.

112. (Original) The system of claim 93 wherein the locations at which the segments of said data file are located are within the multiple storage devices of the first computing system.

113. (Original) The system of claim 93 wherein the locations at which the segments of said data file are located are within multiple storage devices of the plurality of the computing systems.

114. (Original) The system of claim 91 wherein the digital video data file is transferred isochronously to the computing system.